datum Kuetz. (1-b, 2-a, 4, 11-b); P. retzii (C.A. Ag.) Gomont (4, 8-b, 11-b); Lyngbya aerugineo-coerulea (Kuetz.) Gomont (3).

NOSTOCACEAE: Anabaena affinis Lem. (2-a, 2-b, 2-c, 5-a); A. flos-aquae (Lyngb.) Breb. (11-a); A. oscillarioides Bory (8-c); A. spiroides Kleb. (9).

SCYTONEMATACEAE: Hapalosiphon hibernicus West & West (6); Stigonema mamillosum (Lyngb.) C.A. Ag. (11-a).

RIVULARIACEAE: Gloeotrichia echinulata (J.E. Smith) P. Richter (6); Calothrix epiphytica West & West (5-b).

RHODOPHYTA

CHANTRANSIACEAE: Audouinella sp. (4).

BATRACHOSPERMACEAE: Batrachospermum vagum (Roth) C.A. Ag. (4). — DEPT. OF BOTANY, CORNELL UNIVERSITY, ITHACA, N. Y.

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FURTHER NOTES ON CHAMAECYPARIS THYOIDES IN NEW HAMPSHIRE

HENRY I. BALDWIN

H. K. Svenson (Rhodora **31**: 96-98, 1929) describes his three visits to the towns of Bradford, Windsor and Washington, N. H. when he located *Chamaecyparis thyoides* (L.) BSP., in Bradford near the Washington line, presumably along the highway from East Washington to Bradford Center, and at Black Pond and Bagley's Pond in Windsor. He failed to find any stations for this species in the town of Washington, although he and Prof. Fernald made a considerable search for it. Recently, in connection with explora-

tions made for the purpose of acquiring an area where this species might be preserved, the following observations were made. As mentioned by Svenson, this tree is continually being cut for posts and poles, and is fast disappearing. Flooding by beaver dams as well as man-made dams has also taken its toll.

1. *Bradford swamp* adjoining Bradford Mineral Springs is one of the most extensive habitats. It extends from the highway between East Washington and Bradford Center, south to the Bradford-Hillsboro town line and farther along the brook into Hillsboro a considerable distance, where cedar is found today as widely separated single specimens. Along the western side of the swamp near the Bradford-Washington line there still remain clumps of larger trees up to 10″ in diameter, with scattered smaller trees on the fringes of areas clear-cut in 1958. No trees have been found in Washington; it seems probable that collections labelled "East of East Washington Village" were actually made in Bradford. The eastern side of the swamp also contains at least one untouched stand on the fringe of an open black spruce bog. Some cedar is to be found north of the highway near the northern margin of the swamp.

2. *Mud Pond* (also known as Ayers or Nichols Pond) elevation 900′ (area 4.6 acres of which 3 are in Hillsboro) through which the Bradford-Hillsboro town line passes, has long been known to the writer as a station for cedar. When visited over 20 years ago the impression was gained that an extensive stand of fairly large trees surrounded the pond. Possibly these have since been cut. When visited in March 1961 the following observations were made: A small clump of cedar is situated on the southwest border of the pond. The trees are small — mostly 1″ to 4″ in diameter. There is also one small tree on the southeast shore, and one 5″ tree on the east shore. All these are in the town of Hillsboro. There are also four trees along the northeast shore lying in Bradford. Carter Pond at the same elevation, and ringed by black spruce bog, apparently an identical habitat, was searched but no cedar found.

3. *Bagley's Pond*, mentioned by Svenson as a station, lies partly in Windsor and partly in Hillsboro at an elevation of 1,146′. It is 40 acres in extent, of which only three acres are in Hillsboro near the outlet. This was visited on March 26, 1961 and as in the case of the other areas, explored on skis on a hard crust. It was easy to cover all the shore line and the swampy areas at the inlet and outlet. No trace of cedar was found. The water level appeared to have been raised about two feet by a beaver dam at the outlet at some time in recent years and pine, spruce, hemlock and some hardwoods killed, especially in the swamp around the inlet at the west end. A thorough search of this area failed to disclose any dead cedar or stumps. Since Svenson mentioned finding cedar in Bagley's Pond in Windsor, it was presumably in this area where the trees occurred.

4. *Black Pond* in Windsor, elevation 1058′ (area 39 acres) has two main inlets on the south and west bordered by extensive swamps. The water level was raised many years ago for a mill at the outlet, the present site of Windsor Mt. Camps. The dam has been repaired and maintained by the camp. The shores are rather steep in the main part of the pond and no cedar is encountered until one passes the principal island. Part of swamps around the inlets are occupied by cedar of small size, mostly 1″ to 4″ in diameter, growing in thick clumps, usually associated with old stumps of the original cedar that was cut many years ago. The living trees are not over 10 feet in height. Mingled with these are numerous dead cedars of larger size (5″-6″ diameter and 20′ high) that may have been left in the original cutting and killed when the dam was built. All the presently living trees are in water, but the level must drop sufficiently in summer to permit them to survive. Some of the older stumps are one to two feet in diameter. Sections cut from these showed that growth had been extremely slow. One large stump had grown 0.3 inches during the last 10 years; 0.45 inches between 10 and 20 years, and 0.6 inches from the 20th to 30th year, counting back from the bark. Allowing for more rapid growth in youth this would still make it over

100 years old. A 6″ standing dead cedar averaged about 20 rings per inch. Nearby White Pond in Windsor and Stoddard was explored but no cedar found.

5. *Swamp NW of Loverens Mill* on Route 9, Antrim, N. H., elevation 1,036′. This extends for one mile north to the Windsor town line, and is separated from the Black Pond bog by a low height-of-land. Cedar is abundant in the poorly drained portions, disappearing wherever water movement becomes pronounced. It grows in mixture with black spruce *Picea mariana*, red maple and occasional white pine. There is no evidence of cutting in the southern portion, the only part visited. The largest cedars are 6″ to 8″ d.b.h. and younger, smaller trees are scarce due to the dense stand. The extent of the cedar area was not determined.

6. *Robb Reservoir* in Stoddard, elevation 1,275′. Cedar may be seen along the highway from Route 123, about 1 mile south of South Stoddard. This is a swamp at the south end of the Reservoir. Again the cedar occurs in mixture with black spruce and shrubs. (No cedar was found at the outlet or along the shores of Rye Pond in Nelsona short distance to the SE.) Cedar at the Stoddard site was commonly infected with *Gymnosporangium biseptatum*.

Apparently *Chamaecyparis* has not been previously reported from Antrim, Hillsboro or Stoddard, N. H. Hodgdon & Steele[1] do not list these towns. Specimens from these areas have been deposited in the herbaria of the N. E. Botanical Club and the University of New Hampshire.

This tree was found only in wet bogs or swamps with standing water the year round, and with imperfect drainage. Where water movement was evident no cedar was found. Common associated species were black spruce, *Picea mariana* (Mill.) BSP., tamarack, *Larix laricina* (Du Roi) K. Koch, red maple, *Acer rubrum* L., mountain holly, *Nemopanthus mucronata* (L.) Trel., highbush blueberry, *Vaccinium corymbosum* L. and cassandra, *Chamaedaphne calyculata* (L.) Moench. all growing in sphagnum. While cedar was found under these conditions, and in association with these

[1]Hodgdon, Albion R. and Frederic L. Steele, 1958. The Woody Plants of New Hampshire, Bull. 447, N. H. Agr. Exp. Sta.

species, the converse was not true. There are numerous other sites with apparently identical habitat conditions where cedar has not been found. It may very likely occur in other places not yet examined. Certainly it is not possible to state that *Chamaecyparis* does *not* occur in a township without a very detailed survey.

This brief survey of *Chamaecyparis* at its known northwestern limit in New Hampshire serves to indicate the precarious status of plants that cannot maintain themselves when the environment is altered. Reproduction is scanty, growth is slow and is inadequate to restore stocking when cutting and flooding destroy the seed bearing trees. Unless some areas are placed under protection it will be only a matter of time before all *Chamaecyparis* disappears from this region, as it apparently already has from Bagley's Pond.
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WHICH SIDE IS UP?
A LOOK AT THE LEAVES OF ORYZOPSIS

EDWARD G. VOSS

It was no less noted a critic than M. L. Fernald who asserted: "errors once born never die but, on the contrary, by others not situated to know the facts are continually mistaken for the truth and consequently perpetuated." (Rhodora 44: 246. 1942.) After examination of a long series of Michigan specimens of a grass common in dryish woods throughout the state, *Oryzopsis asperifolia* Michx., I was not a little surprised to read in Fernald's 8th edition of Gray's Manual (1950) that the leaves of this species have a "*glaucous lower surface*" (italics are the original emphasis).

Professor Fernald is in good, if not accurate, company. The first edition of Gray's Manual (1848) described the leaves as "pale underneath," and they have been similarly described in all subsequent editions. Torrey's great Flora of New York (1843) — a source in which I often find accurate bits of description omitted by other authors — considers the leaves "glaucous underneath." The official verdict